

CLAIMS

The invention claimed is:

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1. ~~A method of increasing a dynamic range of a backlit display, said method comprising the step of varying a luminance of a light source illuminating a displayed pixel in response to an intensity value of said pixel.~~
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2. The method of claim 1 wherein the step of varying a luminance of a light source illuminating a displayed pixel in response to a intensity of value of said pixel comprises the steps of:
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- (a) determining a luminance of said pixel from said intensity value; and
- (b) varying a luminance of said light source according to a relationship of said luminance of said pixel and said luminance of said light source.
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3. The method of claim 2 wherein said relationship of said luminance of said pixel and said luminance of said light source is a nonlinear relationship.
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4. The method of claim 2 wherein the step of determining a luminance of a pixel from an intensity value comprises the step of filtering an intensity value for a plurality of pixels.
5. The method of claim 4 wherein said relationship of said luminance of said pixel and said luminance of said light source is a nonlinear relationship.
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6. The method of claim 4 further comprising the step of sampling a filtered intensity value at a spatial coordinate corresponding to said light source.

7. The method of claim 6 further comprising the step of rescaling a sample of said filtered intensity value to reflect a nonlinear relationship between said luminance of said light source and said intensity of said displayed pixel.
- 5 8. The method of claim 2 wherein the step of varying a luminance of said light source according to a relationship of said luminance of said pixel and said luminance of said light source comprises the steps of:
- 10 (a) operating said light source at substantially a maximum luminance if a luminance of at least one displayed pixel exceeds a threshold luminance; and
- (b) otherwise, attenuating said luminance of said light source according to a relationship of said luminance of said light source and a luminance of a plurality of pixels.
- 15 9. The method of claim 8 wherein the step of attenuating a luminance of a light source according to a relationship of said luminance of said light source and a luminance of a plurality of pixels comprises the step of attenuating said luminance of said light source according to a relationship of said luminance of said light source and a mean luminance of said plurality of pixels.
- 20 10. The method of claim 9 wherein the step of attenuating a luminance of a light source illuminating a pixel comprises the step of attenuating a luminance of a plurality of light sources illuminating a plurality of pixels comprising a frame in a sequence of video frames.
- 25 11. The method of claim 10 wherein the step of attenuating a luminance of a plurality of light sources illuminating a plurality of pixels comprising a frame in a sequence of video frames comprises the step of attenuating said luminance of said light sources for a subset of frames of said sequence, said subset including less than all said frames of said sequence.
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12. The method of claim 9 wherein said plurality of pixels comprises at least two contiguous pixels.
13. The method of claim 1 wherein the step of varying a luminance of a light source illuminating a displayed pixel comprises the step of varying a luminance of a plurality of light sources illuminating a plurality of displayed pixels substantially comprising a frame in a sequence of video frames.
14. The method of claim 13 wherein the step of varying a luminance of a plurality of light sources illuminating a plurality of pixels substantially comprising a frame in a sequence of video frames comprises the step of varying said luminance of said light sources for less than all frames of said sequence.
15. A method of increasing the dynamic range of a backlit display, said method comprising the steps of:
- (a) determining a luminance of a pixel of an image from a data value for said pixel;
 - (b) filtering said luminance;
 - (c) determining a maximum of said filtered luminance for a plurality of pixels illuminated by a light element of a backlight;
 - (d) determining a statistical value of said filtered luminance for a plurality of pixels illuminated said light element; and
 - (e) illuminating said light element according to a relationship of said maximum of said filtered luminance and said statistical value of said filtered luminance.
16. The method of claim 15 wherein said statistical value of said luminance comprises a mean luminance of said plurality of pixels.

17. The method of claim 15 wherein step of illuminating a light element according to a relationship of a maximum of a filtered luminance for a plurality of pixels and a statistical value of said filtered luminance for a plurality of pixels comprises the steps of:

5 (a) illuminating said light source at a maximum luminance if said maximum of said filtered luminance exceeds a threshold luminance; and

10 (b) otherwise, illuminating said light source at an attenuated luminance, said attenuated luminance determined by a relationship of said statistical value of said luminance of said plurality of pixels and a luminance level of said light source,

15 18. The method of claim 17 wherein said relationship of said statistical value of said luminance of said plurality of pixels and a luminance level of said light source is a nonlinear relationship.

19. A backlit display comprising:

20 (a) a plurality of light source elements;

(b) a light valve arranged for locally modulated transmittance of light from said light source elements, said locally modulated transmittance being responsive to a data value of an image pixel; and

25 (c) a light source controller to modulate a luminance output of a light source element according to a relationship of said luminance output and said data value of said image pixel.

20. The apparatus of claim 19 wherein said light source controller comprises:

30 (a) a data processing unit to determine a power to be applied to a light source element to cause said light source

